Fig.1

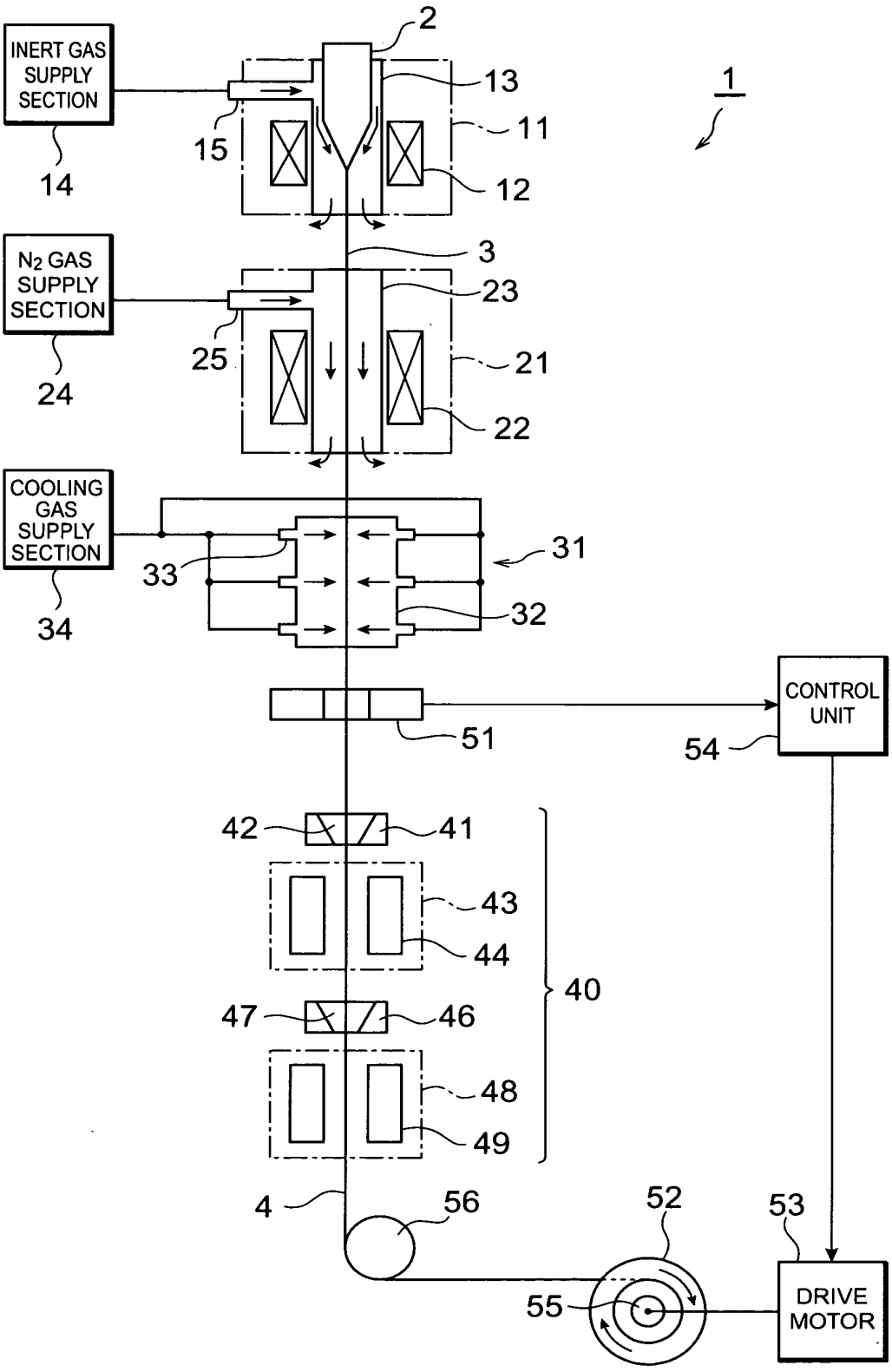
INERT GAS SUPPLY SECTION
14
15
2
13
11
12
1
N_2 GAS SUPPLY SECTION
24
25
3
23
21
22
COOLING GAS SUPPLY SECTION
34
33
31
32
CONTROL UNIT
54
51
42
41
43
44
40
47
46
48
49
4
56
52
53
55
DRIVE MOTOR

Fig.2

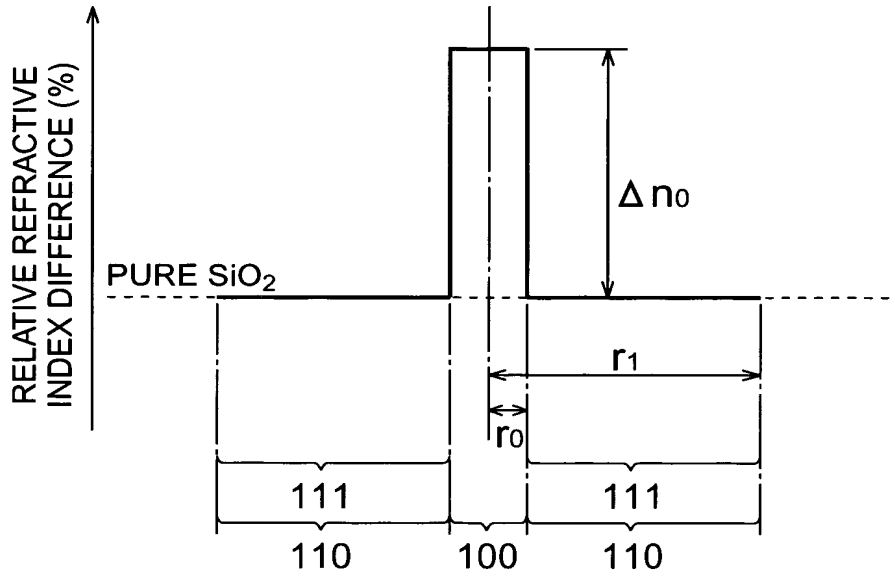
RELATIVE REFRACTIVE INDEX DIFFERENCE (%)
PURE SiO_2
Δn_0
r_1
r_0
111
111
110
100
110

Fig.3

	HEATING FURNACE ANNEALING TEMPERATURE (℃)	COOLING MEANS ENTRY TEMPERATURE (℃)	TRANSMISSION LOSS @1.55 μm (dB/km)	TRANSMISSION LOSS @0.63 μm (dB/km)
EXAMPLE A1	1100	700	0.185	6
EXAMPLE A2	1400	1000	0.180	6
EXAMPLE A3	1550	1200	0.182	7
EXAMPLE A4	1550	1300	0.182	9

Fig.4

	HEATING FURNACE ANNEALING TEMPERATURE (℃)	COOLING MEANS ENTRY TEMPERATURE (℃)	TRANSMISSION LOSS @1.55 μm (dB/km)	TRANSMISSION LOSS @0.63 μm (dB/km)
COMPARATIVE EXAMPLE B1	—	1000	0.190	12
COMPARATIVE EXAMPLE B2	—	500	0.190	6
COMPARATIVE EXAMPLE B3	900	500	0.189	6
COMPARATIVE EXAMPLE B4	1100	500	0.185	6
COMPARATIVE EXAMPLE B5	1650	1300	0.188	10

Fig.5

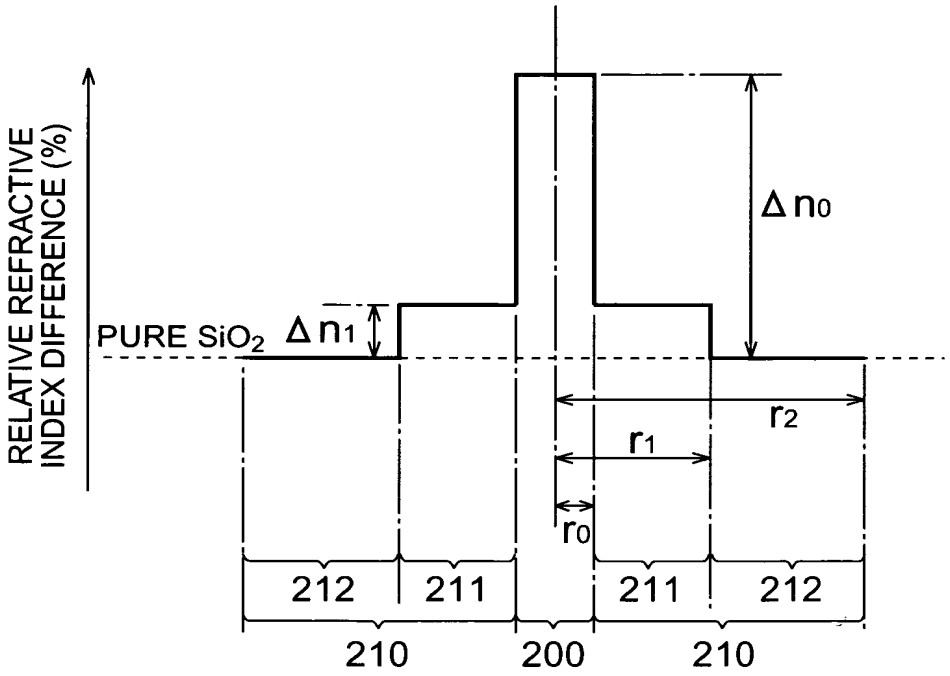
RELATIVE REFRACTIVE INDEX DIFFERENCE (%)
PURE SiO2
Δn1
Δn0
r2
r1
r0
212
211
211
212
210
200
210

Fig.6

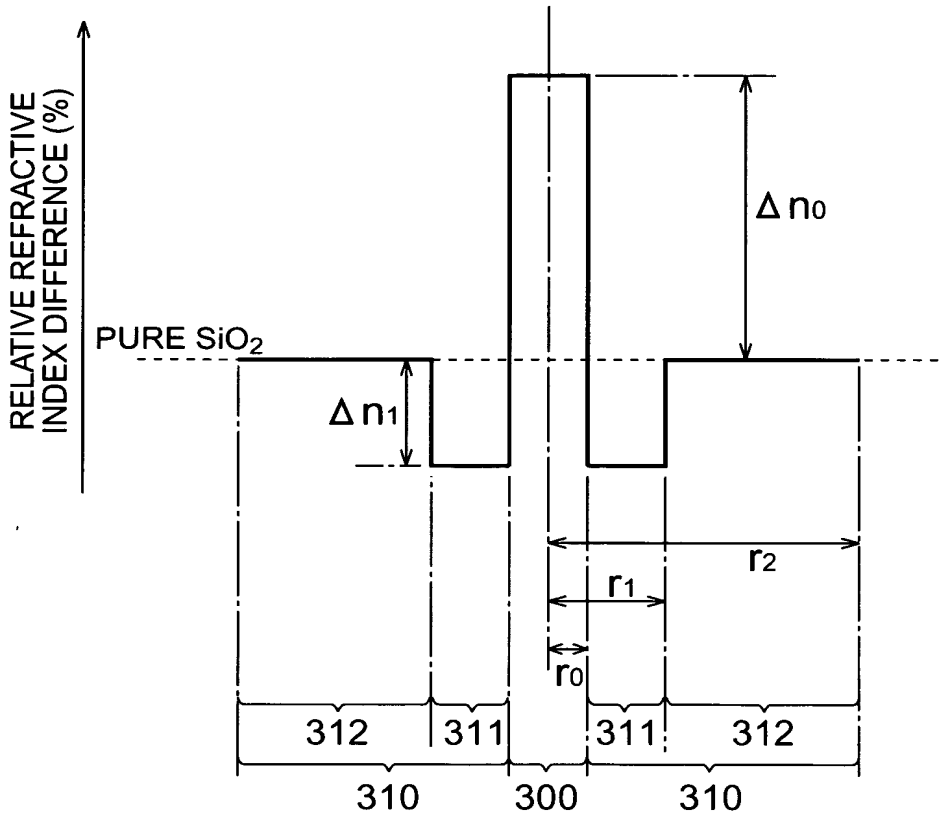
RELATIVE REFRACTIVE INDEX DIFFERENCE (%)
PURE SiO_2
Δn_0
Δn_1
r_2
r_1
r_0
312
311
311
312
310
300
310

Fig.7

	TYPE OF OPTICAL FIBER	CORE REGION Ge QUANTITY OF DOPANT	TRANSMISSION LOSS @1.55 μm (dB/km)	INCREASE IN LOSS $\Delta\alpha$ 1.38 (dB/km)
EXAMPLE C1	Ge-SM	Δn_0= 0.35%	0.180	0.05
COMPARATIVE EXAMPLE D1			0.190	0.2
EXAMPLE C2	DSF	Δn_0= 0.6%	0.188	0.07
COMPARATIVE EXAMPLE D2			0.200	0.3
EXAMPLE C3	DCF	Δn_0= 1.5%	0.228	0.11
COMPARATIVE EXAMPLE D3			0.245	0.6

Fig.8

	HEATING FURNACE EXIT	1m	2m	—	3m	4m	5m	6m	7m
EXAMPLE E	1499	1299	1125	FORCED COOLING	553	—	—	—	—
COMPARATIVE EXAMPLE F	1499	1299	1125	—	976	846	736	637	554

(TEMPERATURE OF OPTICAL FIBER: ℃)

Fig.9

HEATING FURNACE SET TEMPERATURE (℃)		1300	1000	800	500	20
DISTANCE FROM ENTRANCE OF HEATING FURNACE (m)	0	1500	1500	1500	1500	1500
	1	1418	1296	1214	1092	896
	2	1370	1175	1045	850	539
ENTRANCE OF COOLING MEANS		1174	1007	896	729	464
COOLING SPEED (℃/SEC.)		433.3	1083.3	1516.7	2166.7	3203.3
ANNEALING EFFECT		○	○	○	×	×

Vf=400 (m/MINUTE)

Fig.10

HEATING FURNACE SET TEMPERATURE (℃)		1300	1000	800	500	20
DISTANCE FROM ENTRANCE OF HEATING FURNACE (m)	0	1500	1500	1500	1500	1500
	1	1453	1384	1338	1269	1159
	2	1418	1296	1214	1092	896
ENTRANCE OF COOLING MEANS		1041	952	892	803	660
COOLING SPEED (℃/SEC.)		546.7	1360.0	1906.7	2720.0	4026.7
ANNEALING EFFECT		○	○	○	×	×

Vf=800 (m/MINUTE)

Fig.11

HEATING FURNACE SET TEMPERATURE (℃)		1300	1000	800	500	20
DISTANCE FROM ENTRANCE OF HEATING FURNACE (m)	0	1500	1500	1500	1500	1500
	1	1475	1438	1414	1377	1318
	2	1453	1384	1338	1269	1159
	3	1435	1337	1272	1175	1019
	3.5	1426	1316	1243	1132	956
ENTRANCE OF COOLING MEANS		1102	1017	961	876	740
COOLING SPEED (℃/SEC.)		560.1	1400.3	1960.4	2800.5	4144.8
ANNEALING EFFECT		○	○	○	×	×

Vf=1600 (m/MINUTE)

Fig.12

HEATING FURNACE SET TEMPERATURE(℃)		1300	1000	800	500	20
DISTANCE FROM ENTRANCE OF HEATING FURNACE (m)	0	1500	1500	1500	1500	1500
	1	1487	1466	1453	1433	1400
	2	1474	1435	1409	1370	1307
	3	1462	1406	1368	1311	1220
	4	1451	1378	1329	1256	1139
	5	1441	1353	1294	1205	1064
	6	1432	1329	1260	1158	993
	7	1423	1307	1229	1113	928
ENTRANCE OF COOLING MEANS		1240	1139	1071	971	810
COOLING SPEED (℃/SEC.)		552.3	1380.7	1933.0	2761.4	4086.8
ANNEALING EFFECT		○	○	○	×	×

Vf=3000 (m/MINUTE)

Fig.13

HEATING FURNACE SET TEMPERATURE (℃)		1300
DISTANCE FROM ENTRANCE OF HEATING FURNACE (m)	0	1500
	1	1453
	1.5	1435
ENTRANCE OF COOLING MEANS		1053
COOLING SPEED (℃/SEC.)		577.4
ANNEALING EFFECT		×

Vf=800 (m/MINUTE)